

# Europäisches Patentamt European Patent Office Office européen des brevets



(11) **EP 1 408 201 A3** 

(12)

#### **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3: **05.04.2006 Bulletin 2006/14** 

(51) Int Cl.: G01N 21/954 (2006.01) F01D 21/00 (2006.01)

G01N 29/26 (2006.01)

(43) Date of publication A2: **14.04.2004 Bulletin 2004/16** 

(21) Application number: 03022981.9

(22) Date of filing: 10.10.2003

(84) Designated Contracting States:

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR Designated Extension States:

**AL LT LV MK** 

(30) Priority: 10.10.2002 JP 2002297068

(71) Applicant: KABUSHIKI KAISHA TOSHIBA Tokyo (JP)

(72) Inventors:

Saito, Kazuhiro,
 Toshiba Corporation
 Minato-ku
 Tokyo (JP)

 Fujiyama, Kazunari, Toshiba Corporation Minato-ku Tokyo (JP)

Hirasawa, Taiji,
 Toshiba Corporation
 Minato-ku
 Tokyo (JP)

Nagai, Satoshi,
 Toshiba Corporation
 Minato-ku
 Tokyo (JP)

 Fujiwara, Toshihiro, Toshiba Corporation Minato-ku Tokyo (JP)

 Kichise, Hitoshi, Toshiba Corporation Minato-ku Tokyo (JP)

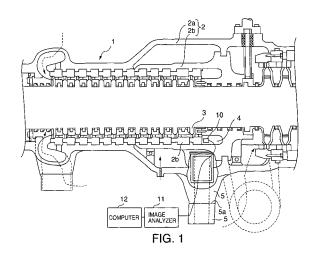
 Kodama, Hirotsugu, Toshiba Corporation Minato-ku Tokyo (JP)

 Okazaki, Mitsuyoshi, Toshiba Corporation Minato-ku Tokyo (JP)

(74) Representative: HOFFMANN EITLE
Patent- und Rechtsanwälte
Arabellastrasse 4
81925 München (DE)

## (54) Steam turbine inspecting method

The present invention provides a method of inspecting a target component part (e.g., valve casing) of an apparatus (e.g., steam control valve) included in a steam turbine system. When a time period in a range of 24 to 100 hours passes from the shutting-down of the turbine system, or before a temperature of an atmosphere surrounding the component part is lowered to 100°C, the width of the opening of the crack formed in the component part or a clearance relating to the component part is measured without disassembling the target component part and an enclosing member (e.g., valve casing) from the apparatus. As the measurement is performed when a thermal stress is induced in the component parts or when the temperature distribution is wide, the risk level of the crack or the clearance is determined accurately.





## **EUROPEAN SEARCH REPORT**

Application Number EP 03 02 2981

	DOCUMENTS CONSIDERE	D TO BE RELEVANT			
Category	Citation of document with indication of relevant passages	on, where appropriate,	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
А	WO 02/25241 A (SIEMENS CORPORATION) 28 March 2 * page 5, line 12 - line page 15, line 11 - line figures *	2002 (2002-03-28) ne 29 *	1,4-9		
A	US 5 164 826 A (DAILEY 17 November 1992 (1992 * column 4, line 8 - 1 * column 4, line 35 - * column 6, line 35 - * figure 1 *	-11-17) ine 15 * line 37 *	1,4-8		
А	US 6 011 617 A (NAUDET 4 January 2000 (2000-0) * column 4, line 38 - * figures *	1-04)	1,5-7		
A	US 4 680 470 A (HEALD 14 July 1987 (1987-07-28 column 3, line 28 - 4 figures 4	14) line 29 *	1,4	TECHNICAL FIELDS SEARCHED (IPC)  G01N F01D	
	Place of search	Date of completion of the search		Examiner	
The Hague		10 February 2006	· ·		
X : part Y : part docu A : tech O : non	ATEGORY OF CITED DOCUMENTS  icularly relevant if taken alone icularly relevant if combined with another iment of the same category nological background -written disclosure rmediate document	T: theory or principle E: earlier patent doc after the filing dat D: document cited in L: document cited fo  when the se document of the se	eument, but publi e n the application or other reasons	shed on, or	

#### ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 03 02 2981

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

10-02-2006

	Patent document cited in search report		Publication date		Patent family member(s)	Publication date
	WO 0225241	A	28-03-2002	AU EP US	9689301 A 1322952 A2 6487922 B1	02-04-2002 02-07-2003 03-12-2002
	US 5164826	A	17-11-1992	CA JP JP	2076305 A1 3167803 B2 7218394 A	20-02-1993 21-05-2001 18-08-1995
	US 6011617	Α	04-01-2000	DE DE EP FR JP	69822761 D1 69822761 T2 0919845 A1 2771515 A1 11237561 A	06-05-2004 13-01-2005 02-06-1999 28-05-1999 31-08-1999
	US 4680470	A	14-07-1987	CA EP	1236591 A1 0147800 A2	10-05-1988 10-07-1985
-1						

FORM P0459

© For more details about this annex : see Official Journal of the European Patent Office, No. 12/82